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REMARKS

In the Office Action, the Examiner reopened prosecution in view of Applicants' Appeal Brief filed on April 25, 2005 and introduced new art to reject the presently pending claims. Specifically, the Examiner rejected: (1) claims 1-10, 12-17, 30-47, 61-69, and 71-74 under 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 6,519,597 to Cheng et al. (hereinafter "Cheng") in view of U.S. Patent No. 5,499,371 to Henninger et al. (hereinafter "Henninger"); and (2) claims 11, 18-29, and 48-60 under 35 U.S.C. §103(a) as being obvious over Cheng in view of Henninger and further in view of U.S. Patent No. 6,418,448 to Sarkar (hereinafter "Sarkar").

In this Amendment, independent claims 1 and 37 have been amended to further define patentable aspects. Claim 67 remains unamended. Thus, it remains unchanged from the claim submitted upon appeal. Claims 2, 5, 8, 38, 41, and 43 have been cancelled. The respective dependencies of claims 3, 6, 9, 12, 13, 39, 42, and 44 have been amended to coincide with the amendments to claims 1 and 37 and the cancellation of claims 2, 5, 8, 38, 41, and 43. New claims 75-77 have been added. No new matter has been introduced. Accordingly, claims 1, 3, 4, 6, 7, 9-37, 39, 40, 42, 44-69, and 71-77 are pending in this application. Claims 1, 37, and 67 are in independent form. Applicants respectfully request reconsideration of the presently pending claims based on the amendments to the claims and for the reasons provided below.

Independent Claims 1, 37, and 67

On page 3 of the Office Action, the Examiner rejected independent claims 1, 37, and 67 under 35 U.S.C. §103(a) as being obvious over Cheng in view of Henninger. "To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)." M.P.E.P. § 2143.03. In this Amendment, Applicants have amended independent claims 1 and 37 to include patentable subject matter already recited in independent claim 67 and in now-cancelled dependent claims 2, 5, 8, 38, 41, and 43. No amendment has been made to independent claim 67. Cheng and Henninger, taken alone or in combination, do not teach or suggest all claim limitations recited in independent claims 1, 37, as amended, and 67, as unamended.

For example, independent claim 37, as amended and independent claim 67, as unamended recite the claim limitation of:

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...an extractor adapted to read automatically a document-type definition and to extract {or "that extracts" in the language of claim 67} metadata representative of the document-type definition from the document-type definition, wherein the extractor stores the metadata in at least three tables comprising a metadata item table containing metadata representative of element types in the document-type definition, a metadata attribute table containing metadata representative of attributes in the document type definition, and a metadata nesting table containing metadata representative of nesting relationships between particles in the document type definition.... (Emphasis added.)

Independent claim 1 as amended recites a similar claim limitation. By storing metadata extracted from a document-type definition (DTD) in multiple tables including a metadata item table, a metadata attribute table, and a metadata nesting table, the metadata is organized in a way that allows the metadata to be accessed using SQL queries, or using queries in another relational database language. This feature provides flexibility for accessing and manipulating the metadata using query languages that are compatible with relational databases. The metadata stored in multiple tables can be directly mapped, or it can be queried to perform optimizing or restructuring on the metadata tables (paragraphs 0072 and 0073 of Applicants' specification).

Cheng and Henninger, taken either alone or in combination, do not teach or suggest the claim limitation of storing extracted metadata in at least three tables comprising a metadata item table, a metadata attribute table, and a metadata nesting table as recited in independent claims 1, 37, and 67. On page 12 of the Office Action, the Examiner relies upon Cheng to reject this claim limitation. However, Cheng does not teach three distinct tables comprising a metadata item table, metadata attribute table, and a metadata nesting table. In direct contrast, Cheng teaches a single DTD reference table (XML_DTD_REF) that "stores all of the information about the DTDs that can be used by XML documents" (col. 11, lines 57-60 of Cheng, emphasis added). Cheng further teaches that with the DTD reference table, "no duplication information needs to be stored in normal tables with XML columns" (col. 11, lines 65-67 of Cheng). Accordingly, Cheng does not teach or suggest storing DTD metadata in three distinct tables.

Because claim limitations related to storing extracted types of metadata in multiple different tables were previously recited in now cancelled dependent claims 2, 5, and 8, a discussion of the rejections of those previously pending claims is relevant. In rejecting the metadata item table recited in claim 2, the Examiner relied upon the DTD reference table taught in Cheng (page 5 of the Office Action, citing col. 11, lines 60-65 of Cheng). In

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rejecting the metadata attribute table recited in claim 5, the Examiner again relies upon the DTD reference table taught in Cheng (pages 5 and 6 of the Office Action, citing col. 8, lines 57-67 of Cheng). From the rejections of claims 2 and 5, it is clear that the Examiner relies upon a single table taught in Cheng to reject both the metadata item table and the metadata attribute table, which are two of the at least three tables recited in independent claims 1, 37, and 67. A single table cannot reasonably be relied upon to reject two of the three distinct tables recited in the independent claims.

Moreover, the rejection of the metadata nesting table recited in previously pending claim 8 does not even mention a table. To reject claim 8, the Examiner relies upon SQL query statements defining containment relationships (page 7 of the Office Action, citing col. 14, lines 36-42 of Cheng.). SQL query statements do not teach or suggest a metadata nesting table.

Moreover, none of the tables (e.g., the DTD reference table, internal registration table, or XML column tables) disclosed in Cheng is specifically purposed for metadata items, metadata attributes, or metadata nesting relationships. Any storage of an entire XML document or DTD into a table (e.g., the DTD reference table or internal registration table of Cheng) fails to store different types of metadata into separate tables. Thus, Cheng does not teach or suggest the claim limitation of storing the metadata in at least three tables comprising a metadata item table, a metadata attribute table, and a metadata nesting table, as required by independent claims 1, 37, and 67.

Henninger was cited to disclose automatically generating source code for constructing relational database schema and transform (pages 5 and 12 of the Office Action) and, as such, does nothing to cure the deficiencies of Cheng with respect to the claim limitation of storing metadata in at least three tables comprising a metadata item table, a metadata attribute table, and a metadata nesting table. Sarkar was cited to disclose an entity relationship diagram relating to XML/RDF and, as such, does nothing to cure the deficiencies of Cheng and Henninger with respect to independent claims 1, 37, and 67.

Based on the foregoing reasons, the Office Action does not establish a *prima facie* case of obviousness against independent claims 1 and 37, as amended and claim 67, as unamended, and Applicants respectfully request that the Examiner withdraw the rejections of these claims, which are in condition for allowance. Claims 3, 4, 6, 7, 9-36, 39, 40, 42, 44-66, 68, 69, and 71-74 are also in condition for allowance by way of their respective dependencies from independent claim 1, 37, or 67.

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The Dependent Claims Recite Patentable Subject Matter

As mentioned above, the dependent claims are in condition for allowance because of their respective dependencies from independent claim 1, 37, or 67. The dependent claims also recite independently patentable subject matter. Merely by way of example, claims 3, 23, 24, 33, 39, 42, 53, and 54 recite patentable subject matter, as discussed below.

A. Claim 33

Claim 33 recites the claim limitation of "wherein the optimizing step further comprises the step of inlining particular attributes of the metadata." As discussed in paragraphs 00171 through 00179 of Applicants' specification, an example of inlining particular attributes of metadata includes a process of identifying two items (e.g., item A and item B) in the metadata tables that have a one-to-one relationship, where the child item (item B) has no child of its own, and converting the attributes (e.g., attribute X) of the child item (item B) into attributes (e.g., attribute B_X) of the parent item (item A). After inlining the particular attributes of the metadata, the number of nesting relationships in the metadata is generally reduced, thereby optimizing the metadata.

The cited prior art does not teach or suggest any feature related to the claim limitation of optimizing metadata by inlining particular attributes of the metadata. On page 8 of the Office Action, the Examiner relies upon Cheng to reject claim 33. However, the sections of Cheng relied upon by the Examiner (i.e., col. 2, lines 60-64 and col. 3, lines 12-18 and lines 45-50) have nothing to do with inlining attributes of metadata as recited in claim 33. Rather, these sections of Cheng merely disclose storing attributes in a column of a relational database table, searching attribute values, and retrieving XML documents. These teachings of Cheng do not in any way amount to a disclosure of the claim limitation of optimizing metadata by inlining particular attributes of the metadata. Henninger was cited to disclose automatically generating source code for constructing relational database schema and transform and, as such, does nothing to cure the deficiencies of Cheng with respect to the claim limitation of optimizing metadata by inlining particular attributes of the metadata. Sarkar was cited to disclose an entity relationship diagram relating to XML/RDF and, as such, does nothing to cure the deficiencies of Cheng and Henninger with respect to claim 33. Therefore, the cited prior art fails to teach or suggest the claim limitations recited in claim 33, and Applicants respectfully request that the Examiner withdraw the rejection of this claim, which is in condition for allowance.

B. Claims 23, 24, 53, and 54

Claim 23, which depends indirectly from independent claim 1, recites the claim

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limitation of "directly mapping a link into the link table for each item in the metadata nesting table that does not contain a group type." Claim 24, which depends from claim 23, recites the claim limitation of "creating an additional link table containing a mapping of a link pattern for each group type identified in the metadata item table." Claims 53 and 54, which depend indirectly from independent claim 37, recite similar claim limitations. The elements of these claims, when considered in the entire context of the claims, their base claims, and any intervening claims, relate to a feature that maps links for non-group-type items into a first link table and links for group-type items into a second link table. By mapping group-type items to a distinct table, complex many-to-many relationships between different elements are captured by joins on particular types of attributes. The joins are represented by join constraints in the distinct table (paragraphs 00154 through 00165 of Applicants' specification).

On pages 15 and 17 of the Office Action, the Examiner relies upon col. 7, lines 17-22, col. 13, lines 46-50, and col. 14, lines 36-42 of Cheng to reject claims 23, 24, 53, and 54. However, these sections of Cheng do not have anything to do with mapping links for group-type items to a first table and links for non-group-type items to a second distinct table. For example, col. 7, lines 17-22 of Cheng simply disclose an abstract data type (ADT) 142 that allows a user to define data types for a database engine, col. 13, lines 46-50 of Cheng simply disclose an XML column mapped to a DTD in the XML_DTD_REF table, and col. 14, lines 36-42 simply disclose a query that is to be directed to content using a specific path.. Clearly, none of these teachings is related to mapping links for group-type items to a first table and mapping links for non-group-type items to a second distinct table, based on whether items are group type or non-group type. Applicants cannot find any such teaching or suggestion in Cheng. Henninger was cited to disclose automatically generating source code for constructing relational database schema and transform and, as such, does nothing to cure the deficiencies of Cheng with respect to mapping links for group-type items to a first table and links for non-group-type items to a second distinct table. Sarkar was cited to disclose an entity relationship diagram relating to XML/RDF and, as such, does nothing to cure the deficiencies of Cheng and Henninger with respect to claims 23, 24, 53, and 54. Therefore, the cited prior art fails to teach or suggest the claim limitations recited in claims 23, 24, 53, and 54, and Applicants respectfully request that the Examiner withdraw the rejection of these claims, which are in condition for allowance. Claims 25-29 and 55-60 are also in condition for allowance as dependents of claims 24 and 54, respectively.

C. Dependent Claims 3 and 39

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In Applicants' response filed December 21, 2004 and again in Applicants' appeal brief filed April 25, 2005, Applicants presented arguments for the patentability of dependent claims 3 and 39. Unfortunately, the instant Office Action simply repeats the reasons for rejecting these claims and fails to address Applicants' arguments. Therefore, Applicants repeat those arguments herein and respectfully request that the Examiner address the arguments in the next office action if the Examiner continues to rely upon Cheng to reject claims 3 and 39.

Claims 3 and 39 are in condition for allowance because they depend from independent claims 1 and 37, respectively. Claims 3 and 39 are also independently patentable over the prior art of record. Claim 3 recites the claim limitation of "creating at least one default item in the item metadata table." Similarly, claim 39 recites the claim limitation of an extractor that creates at least one default item in the item metadata table. The Examiner continues to rely on column 12, lines 35-38 of Cheng to reject the claim limitation of creating at least one default item in the item metadata table (pages 5 and 9 of the Office Action). However, this section of Cheng does not even mention the word "default." In fact, the only mention of the word "default" in Cheng is limited to a default transformation function for use in retrieving an XML document (col. 20, lines 7-15 of Cheng). Cheng's default function is different from and in no way teaches or suggests the claimed default item because using a default function when retrieving an XML document is completely unrelated to creating a default item in the item metadata table. The default item taken in the context of claim 3 is entirely distinct from a default function as taught in Cheng.

Henninger and Sarkar also fail to disclose the claim limitation of creating at least one default item in the item metadata table. Neither Henninger nor Sarkar contains any mention the word "default." Because the prior art of record fails to teach or suggest the claim limitation of creating a default item in the item metadata table, Applicants respectfully request that the Examiner withdraw the rejections of claims 3 and 39, which are in condition for allowance. Claims 4, 6, 7, 9-29, 40, 42, and 44-49 are also in condition for allowance because of their respective dependencies from claim 3 or 39.

D. Dependent Claim 42

In Applicants' response filed December 21, 2004 and again in Applicants' appeal brief filed April 25, 2005, Applicants presented arguments for the patentability of dependent claim 42. Unfortunately, the Office Action simply repeats the reasons for rejecting this claim and fails to address Applicants' arguments. Therefore, Applicants repeat those arguments herein and respectfully request that the Examiner address the arguments in the next office

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action if the Examiner continues to rely upon the same reasons for rejecting claim 42.

Claim 42 is in condition for allowance because it depends from independent claim 37 (by way of claims 38-41). Claim 42 is also independently patentable over the prior art of record because the Office Action fails to establish a *prima facie* case of obviousness against the claim. On page 9 of the Office Action, the Examiner rejected claim 42 based on the assertion that claim 42 is essentially the same as claim 6 but directed to a system rather than a method. Appellants respectfully disagree with the Examiner's assertion that claim 42 is essentially the same as claim 6. Claim 6 includes the limitation of creating a default attribute value in the attribute metadata table, while claim 42 recites an extractor that "generates a row in the attribute metadata table corresponding to each of the attribute type content particles of the document-type definition." Clearly, claim 42 includes limitations that cannot be rejected for the same reason used to reject claim 6. For example, the claim limitation of generating a row is not recited in claim 6. Therefore, the Examiner has failed to establish a *prima facie* case of obviousness against claim 42 (MPEP 2143), and Applicants respectfully request that the Examiner withdraw the rejection of claim 42, which is in condition for allowance. Claims 44-49 are also in condition for allowance as dependents of claim 42.

New Claims 75-77

New claims 75-77, which depend directly or indirectly from independent claim 1, recite subject matter not taught or suggested in the prior art of record. New claim 75, which depends from claim 33, recites the claim limitation of "the step of inlining the particular attributes of the metadata reduces a number of nesting relationships and increases a number of attributes in the metadata." New claim 76 recites:

76. The method of claim 1, and further comprising optimizing the metadata by searching the metadata nesting table for a parent item and a child item having a one-to-one relationship where the child item does not have its own child, and inlining an attribute of the child item into an attribute of the parent item.

New claim 77, which depends from claim 76, recites the claim limitation of "the optimizing step further includes removing the inlined attribute of the child item from the metadata item table." Applicants cannot find any teaching or suggestion of these limitations in the prior art of record. Therefore, Applicants respectfully submit that new claims 75-77 are patentable over the prior art of record.

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CONCLUSION

Reconsideration and allowance are respectfully requested. In view of the above, each of the presently pending claims in this application is believed to be in condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue. It is believed that any fees associated with the filing of this paper are identified in an accompanying transmittal. However, if any additional fees are required, they may be charged to Deposit Account 07-2347, under Order No. 00-8013 from which the undersigned is authorized to draw. To the extent necessary a petition for extension of time under 37 C.F.R. § 1.136(a) is hereby made, the fee for which should be charged to the aforementioned deposit account.

Respectfully submitted,

Dated: October 12, 2005

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